

# Cross-Country Comparability of the Eurosystem Household Finance and Consumption Survey

Pirmin Fessler,  
Martin Schürz<sup>1</sup>

The ECB recently published the first results of the euro area Household Finance and Consumption Survey (HFCS) and a report on the methodologies applied (ECB, 2013a and 2013b). The fact that the HFCS results vary considerably across the euro area gives rise to questions regarding their comparability. We question the focus on mean and median country rankings and argue for comparisons along the full unconditional net wealth distributions. Such analyses reveal large within-country variation as well as remarkable similarities between countries with regard to the distributions of net wealth. We discuss the relevance of household size and homeownership in this context and point out important caveats with regard to the interpretation of results. In the appendix we summarize relevant methodological differences which need to be taken into account in case of cross-country comparisons.

JEL classification: D12, D14, D31

Keywords: net wealth, HFCS, inequality, distribution, data comparability, survey data

## 1 Introduction

The purpose of this article is twofold. First, we highlight the major challenges of interpretation that arise when the Eurosystem Household Finance and Consumption Survey (HFCS) is used for cross-country comparisons. Second, we wish to increase the awareness of researchers who will work with HFCS data about the influence of survey methodology on the outcome of statistical analysis (see appendix). Even though the specific characteristics of the data were addressed in detail in the publications of the Eurosystem Household Finance and Consumption Network (ECB, 2013a and 2013b), the ensuing scientific and public discussion has shown that a follow-up discussion of some points might facilitate a better understanding of the particulars of the HFCS dataset.

The goal of surveys is to gather information on a predefined topic from predefined units of observation. These units will differ from each other to some extent (for instance with regard to household composition) but a survey cannot

be expected to be designed to account for those differences *ex ante*. What is important, though, especially in the case of a multi-country survey project like the HFCS, is to harmonize the methodology to the highest degree possible.

A lack of harmonization is the key drawback of the Luxembourg Wealth Study (LWS), which used to be the only source of data available for international wealth comparisons (Sierminska et al., 2006). There, the different national surveys are based on different definitions of wealth, and the methodology for collecting and processing the data was not harmonized.

In contrast, the HFCS uses common concepts for a large number of variables surveyed, such as wealth, income and consumption. Because of the large number of detailed items, researchers are in the position to construct their own wealth definition (see [www.ecb.int/home/html/researcher\\_hfcn.en.html](http://www.ecb.int/home/html/researcher_hfcn.en.html) and [www.hfcs.at](http://www.hfcs.at)). Furthermore, the definition of the research unit, namely the household, was agreed *ex ante*, and the methodology with re-

<sup>1</sup> Oesterreichische Nationalbank, Economic Analysis Division, [pirmin.fessler@oenb.at](mailto:pirmin.fessler@oenb.at), [martin.schuerz@oenb.at](mailto:martin.schuerz@oenb.at). We thank Ernest Gnan, Jennifer Gredler, Doris Ritzberger-Grünwald and Inge Schuch for valuable comments.

Refereed by:  
Carlos Sánchez Muñoz,  
ECB

gard to the process of data production was harmonized extensively up front (ECB, 2013b).

The HFCS provides harmonized information on the balance sheets of more than 62,000 households in 15 euro area countries (all but Ireland and Estonia). The insights established into household resources and behavior allow for a better understanding of the monetary transmission mechanisms and of risks for financial stability.

Earlier studies have generated some key facts about the distribution of wealth in general (among them Kennickell, 2012; Wolff, 2012; Cowell et al., 2012; Davies and Shorrocks, 2000): Net wealth is very concentrated and distributed much more unequally than income. The bottom 50% in the wealth distribution of households holds only a tiny fraction of the aggregate wealth. Non-financial assets outweigh financial assets and consist mainly of households' main residences.

Household wealth was lower during the period from the 1950s to the 1970s than in later decades, reflecting among other things recovery from real and nominal wealth destruction during and after World War II. Piketty and Saez (2012) also mention anti-private capital policies including rent control, financial repression and nationalization policies. Politics were reversed in the 1980s and 1990s via globalization, deregulation and "large wealth transfers from public to private hands through cheap privatization." Thus the rise of private wealth is partly due to a decline of government wealth.

This article is structured as follows. The main part of the article is section 2, where we analyze the net wealth distributions across countries. Section 3 concludes the article by stressing the importance of careful collection of primary data as well as transparency

with regard to the data production process and argues in favor of cautious data analyses. In the appendix we sum up the methodological differences which might be especially important with regard to cross-country comparison.

## 2 Cross-Country Net Wealth Comparison

A comparison of the absolute net wealth figures in different percentiles in different countries of the euro area shows a lot of dispersion (see table 1). Some countries have rather low medians but comparatively high wealth values at the right tail of the distribution. This may lead to questionable debates as to which countries are richer and which countries are poorer in the euro area.

Table 2 shows the Gini coefficients and the shares in overall household net wealth held by the lower 50%, the top 10% as well as the top 5% of households. Whereas differences in these measures between countries should be interpreted with great caution, as we will discuss, the rather strong inequality of net wealth – compared to the distribution of income – in all countries is clearly visible. The stylized fact that households in the lower half of the distribution hold only a tiny fraction of aggregate wealth, while the share of households at the top is rather large, is confirmed for all countries.

### 2.1 Where in the Euro Area Are Households Wealthiest?

An overall picture of wealth distribution in the euro area has to combine two aspects: wealth distribution within each individual country and across countries. A key result of the HFCS is that households' wealth positions are very heterogeneous across countries, but even more so within countries. As opposed to the world income distribution, where those at the top of the

Table 1

### Selected Net Wealth Percentiles

	EA	AT	BE	CY	DE	ES	FI	FR	GR	IT	LU	MT	NL	PT	SI	SK
<i>EUR thousand</i>																
P1	-21.2	-38.0	-4.0	-29.7	-20.6	-27.7	-45.6	-10.6	-7.6	-2.0	-24.2	0.0	-163.1	-7.3	-7.3	-0.3
P5	0.0	-0.2	0.3	0.0	-1.6	0.2	-8.4	0.4	0.0	1.0	0.1	4.0	-34.6	0.1	0.3	1.5
P10	1.2	1.0	2.8	7.3	0.1	5.7	-0.6	1.6	2.0	5.0	5.0	16.1	-3.8	1.0	4.2	12.9
P20	8.0	6.1	18.0	59.4	3.5	55.4	2.9	5.7	15.0	18.0	34.7	63.0	7.1	8.8	28.1	30.2
P30	27.0	15.0	80.6	126.5	11.6	100.2	14.0	17.7	48.7	57.5	119.3	113.5	26.0	30.7	54.4	40.4
P40	61.8	34.7	149.6	189.1	27.8	140.8	46.2	53.4	73.8	116.3	269.2	165.3	62.4	52.2	71.8	50.8
P50	109.2	76.4	206.2	266.9	51.4	182.7	85.8	115.8	101.9	173.5	397.8	215.9	103.6	75.2	100.7	61.2
P60	167.4	139.6	274.1	357.7	97.2	228.2	130.1	174.8	129.8	221.4	502.2	267.7	155.5	100.3	136.4	72.4
P70	230.5	208.4	359.4	509.8	163.5	289.2	181.9	237.2	166.3	283.0	637.5	338.2	219.9	135.0	177.8	86.1
P80	320.6	310.8	483.6	768.6	261.1	387.4	262.9	328.8	220.4	375.5	889.7	452.8	304.0	188.1	237.5	108.0
P90	506.2	542.2	705.1	1,469.9	442.3	607.7	397.3	511.6	331.8	577.1	1,375.4	693.1	427.6	297.2	317.2	151.9
P95	762.1	934.6	1,073.4	2,411.9	661.2	878.5	553.6	775.4	469.3	855.0	2,023.9	1,049.4	581.2	482.4	434.5	207.4
P99	1,885.5	3,239.6	2,861.9	7,327.6	1,929.3	1,857.4	1,090.5	1,782.1	909.1	2,139.0	6,027.4	1,868.1	1,042.1	1,243.1	878.8	448.2

Source: Eurosystem HFCS 2010.

Note: In the following, EA will be used to denote "euro area (excluding Ireland and Estonia)".

Table 2

### Net Wealth Distribution – Inequality

	Gini coefficient	Share of the lower 50%	Share of the top 10%	Share of the top 5%
<i>%</i>				
EA	0.68	6.0	50.4	37.2
AT	0.76	2.8	61.1	47.6
BE	0.61	10.1	44.0	31.3
CY	0.70	7.4	56.7	42.5
DE	0.76	2.8	59.2	45.6
ES	0.58	13.0	43.4	30.9
FI	0.66	5.2	45.0	30.6
FR	0.68	5.4	50.0	36.5
GR	0.56	12.4	38.8	25.4
IT	0.61	10.2	44.8	32.1
LU	0.66	8.6	51.3	39.9
MT	0.60	12.5	46.8	35.3
NL	0.65	4.9	40.1	25.7
PT	0.67	8.3	52.7	40.7
SI	0.53	13.8	35.7	22.4
SK	0.45	20.6	32.8	21.8

Source: Eurosystem HFCS 2010.

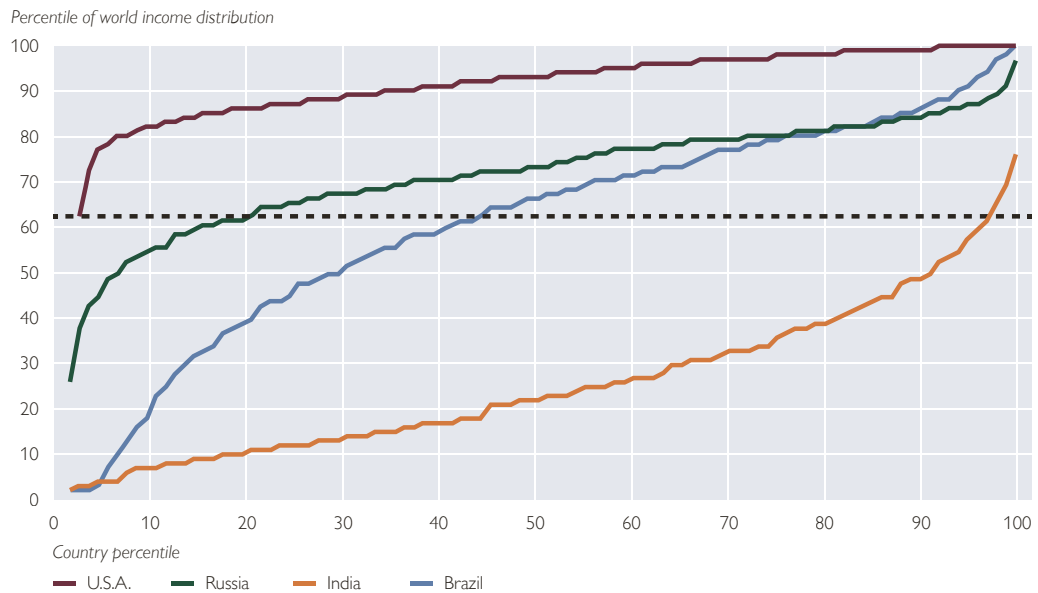
income distribution in one country can be at the very bottom of the income distribution in another country, in the euro area's wealth distribution, households from all countries can be found in all net wealth deciles of the euro area. With regard to income distribution, almost all people that live in a richer

country are better off than most people that live in a poorer country. This is illustrated by chart 1 if we compare the United States and India. The conclusion is that there is only a tiny overlap between rich and poor countries. Relatively rich people in India are comparable to the poorest people in the United States in terms of income. In the context of income it makes sense to talk about poor and rich countries. Accordingly, Branko Milanovic (2011) concludes that it is extremely important where you are born. The place of birth determines more than 60% of variability of global income.

Chart 2 shows the composition of euro area net wealth deciles by countries. To visualize also the shares of smaller countries (which may be proportional with those of other countries or disproportionately high or low) the individual countries have been re-weighted to equal size. This means that each country would have a 1/15<sup>th</sup> share in every decile (as there are 15 countries participating in the first wave of the HFCS) if net wealth was distributed equally across countries.

Chart 1

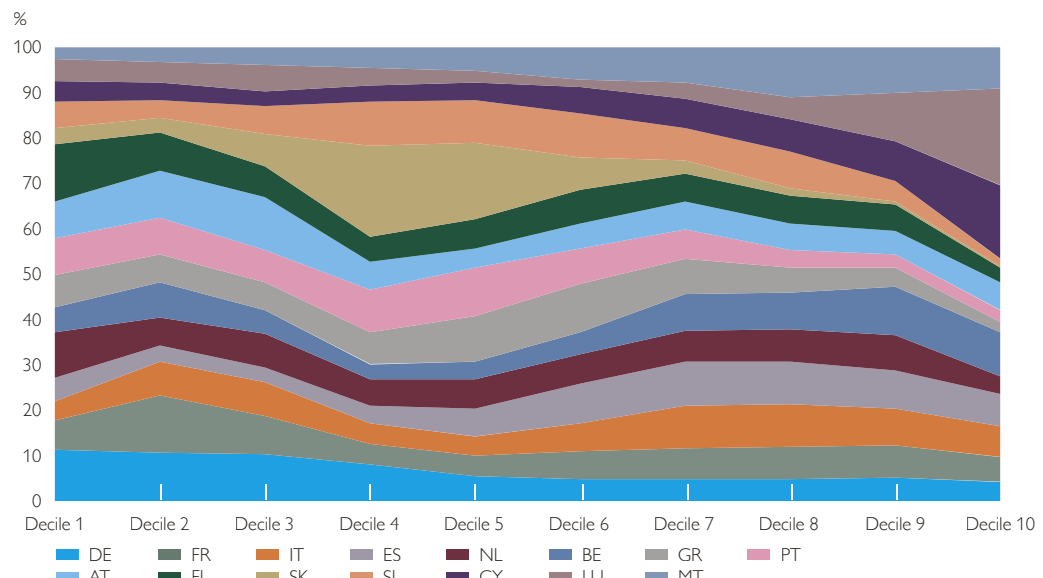
### Income Inequality as Illustrated by Selected Countries



Source: Milanovic (2011).

Chart 2

### Composition of Euro Area Net Wealth Deciles by Countries



Source: OeNB.

Note: Countries have been reweighted to equal size: They would each have a 1/15<sup>th</sup> share (=6.7%) in every decile (i.e. all lines would be straight) if net wealth was distributed equally across the individual euro area countries.

However, we find the euro area distribution to contain a disproportionately large number of households from Luxembourg and Cyprus at the top,

and a disproportionately large number of households from Slovakia in the middle. However, all countries have a share in all deciles of the euro area, and the

share of most countries is surprisingly close to their proportional population share (1/15<sup>th</sup>). In other words, the wealthy households are spread over all countries in the euro area in a rather stable pattern.

The absolute and relative wealth differences between households within each country are found to be very pronounced in all euro area countries. The patterns of these differences are remarkably stable in absolute as well as in relative terms. In all euro area countries a small fraction of the population holds a large share of wealth whereas the bottom half holds only a tiny share of total wealth.

## 2.2 Are Households Who Own Their Homes Wealthier Than Others?

In some countries households might have benefited from house price increases since they bought or inherited real estate. They might have used their savings to pay back a mortgage. They might have left their parents' home rather late in order to build up sufficient financial assets to buy a home of their own because the rental market is small and/or no social housing is available. This last consideration might also affect the household structure and in turn the distribution of wealth among households only because of their size and age composition.

These possible channels show how homeownership is interwoven with observed differences in wealth. But we should be careful with hasty conclusions. Homeownership patterns are highly mixed across and within countries in the euro area. The lowest ownership rate with regard to households' main residence can be found in Germany (44.2%), closely followed by Austria (47.7%). Slovakia, on the contrary, has an ownership rate of 89.9%, followed by Spain with 82.7%. In the

case of Austria, however, the homeownership rate of 47.7% masks a rate of 19.8% for Vienna and of 56.2% for the rest of Austria excluding Vienna, and even 74.6% for one province (Burgenland). Thus, the relative and even absolute differences in homeownership rates among the Austrian provinces alone exceed the differences across HFCS euro area countries.

Furthermore, as the homeownership rate of urbanized Luxembourg (67.1%) underlines, the homeownership pattern is obviously not a question of urban regions versus the countryside. Some of the differences between countries can also be explained by policy decisions. To give two examples: After the German reunification most people became tenants of their formerly state-owned main residences. Ownership stayed with the state or was privatized on larger scales. In Slovakia, in contrast, most people became owners of their main residences after the establishment of the Slovak Republic.

Table 3

### Median Net Wealth by Ownership of Household Main Residence

	Owners of household main residence	Nonowners of household main residence	Median net wealth
	<i>EUR thousand</i>		
EA	217.6	9.1	109.2
AT	241.2	11.6	76.4
BE	304.1	7.6	206.2
CY	349.0	16.3	266.9
DE	215.5	10.3	51.4
ES	214.3	5.1	182.7
FI	153.1	2.8	85.8
FR	238.4	7.8	115.8
GR	136.5	5.4	101.9
IT	250.8	10.8	173.5
LU	556.2	22.1	397.8
MT	267.0	21.7	215.9
NL	214.8	19.3	103.6
PT	106.1	4.5	75.2
SI	134.0	3.5	100.7
SK	65.6	2.2	61.2

Source: Eurosystem HFCS 2010 (ECB Statistical Tables).

Understanding the different patterns of homeownership across countries but also within countries might help to understand some of the differences in wealth we observe. In any case arguing that homeownership is the main driver of cross-country difference is a strong oversimplification. The country differences are the result of complex processes that have to be analyzed further in research.

### **2.3 Medians and Means: Which Indicator for Country Comparisons?**

The median is a statistically robust measure and the mean is not, given that just a few observations can cause it to change a lot. In general, the mean very likely reflects the situation of no observed household at all but will, in the case of net wealth, lie closer to some households in the upper part of the distributions. The median reflects the wealth position of exactly one household and splits the middle between those households that are wealthier and those that are less wealthy.

At a first glance the median appears to be the obvious choice because it is useful for avoiding the large influence of outliers that would distort the indicator. Yet, in some countries, the median of net wealth represents a household that owns a home and in others the median will represent a tenant household. In other words, in some countries the distribution around the median might be much more equal than in others. What is even more important for cross-country comparisons, though, is that neither the median nor the mean includes any information on the distribution. In other words, both measures mask heterogeneity within countries while focusing on differences at certain points of the distributions rather than on the variation

between the countries' overall distributions.

We suggest looking at the full distributions to observe cross-country differences as well as the full range of heterogeneity within countries. When we compare the full distributions across countries, we see a large amount of overlap between countries. In chart 3a we plot 21 percentiles (19 ventiles, P5–P95, as well as P1 and P99) of the net wealth distributions of Austria as well as Cyprus, Germany, Greece and Luxembourg, because those countries were the ones that got the biggest media attention in the “poor Germans – rich southern countries” debate. Similar charts including all other HFCS countries can be found in the appendix.

As a unit of measurement we use the euro area HFCS net wealth percentiles P1 to P99. The euro area percentiles form the 45 degree line. Reading the chart is straightforward: For example, Luxembourg's net wealth distribution always lies above the euro area distribution, implying that all Luxembourg households with more net wealth than the bottom 20% of all Luxembourg households always have a higher net wealth than their euro area counterparts. At the same time, for example about 45% of the Greek or Austrian households which – at this point – lie below the euro area line (go straight to the right from where the Luxembourg line crosses the 50<sup>th</sup> euro area percentile) have more wealth than 30% of all Luxembourg households (the point on the x-axis where the Luxembourg line crosses the 50<sup>th</sup> euro area percentile).

The dispersion of wealth is enormous in all countries. The 95<sup>th</sup> percentile of all countries lies at least above the 85<sup>th</sup> percentile of the euro area, and at the same time the 5<sup>th</sup> percentile of all countries lies at least



Chart 3

below the 10<sup>th</sup> percentile of the euro area. The chart also allows an interpretation in absolute terms. For example at least the bottom 10% of households (in Cyprus) or at most the bottom 25% (in Germany) has less than EUR 8,000 in net wealth (20<sup>th</sup> euro area percentile). Furthermore the local slope of the country distribution lines is also a measure of local inequality with regard to the euro area as a whole (45 degree line) or other countries and in that sense also says something about robustness when comparing certain percentiles such as the median between countries. For example the Austrian distribution is relatively steep around the median. It rises from being below the 35<sup>th</sup> euro area percentile at the Austrian 40<sup>th</sup> percentile to exceed the 55<sup>th</sup> euro area percentile at the Austrian 60<sup>th</sup> percentile. Over the same distance (40<sup>th</sup>–60<sup>th</sup> percentile), the Greek distribution ranges only from below the 45<sup>th</sup> to below the 55<sup>th</sup> euro area percentile.

Neither a mean, nor a median or a Gini coefficient nor any other type of function mapping the wealth distribution into a single number can substitute for a thorough examination of the full distribution of net wealth. In the case of the euro area, the distributions of net wealth largely overlap for all countries and change their shape along the way from the bottom to the top (see appendix). A ranking of HFCS countries in terms of household wealth would be misleading. This is why only an in-depth analysis of the complete distribution of wealth will produce meaningful results.

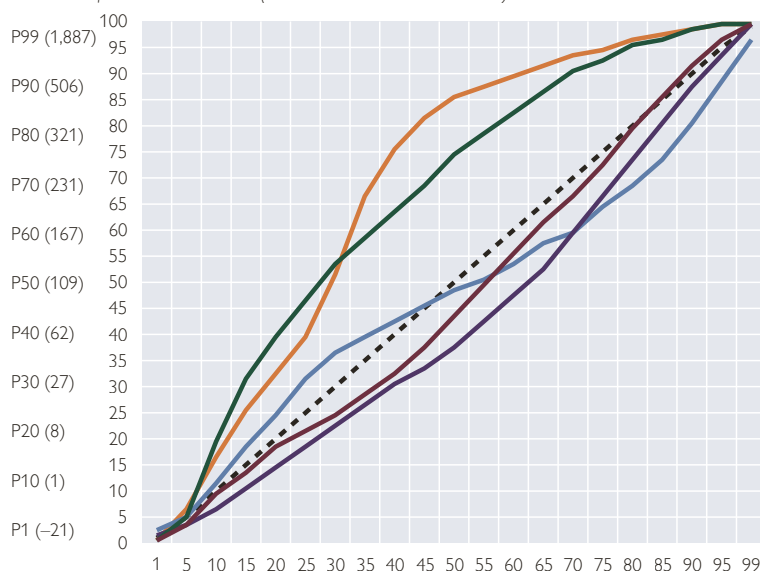
## 2.4 Household Structure

The HFCS was designed with the household as the unit of observation. It is mostly for practical reasons that most wealth items are not gathered at the personal level. Some parts of house-

### Net Wealth Distribution in Europe – Results for Austria, Cyprus, Germany, Greece and Luxembourg

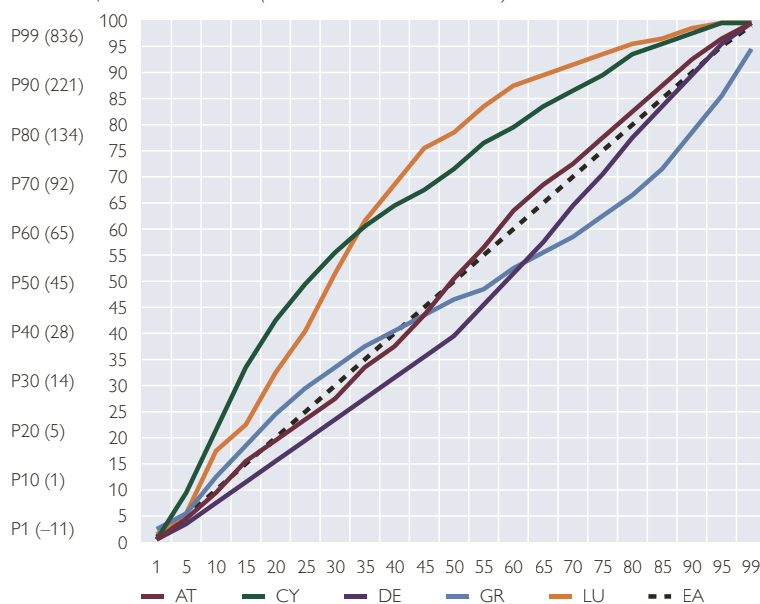
#### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



#### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

holds' differences in wealth simply reflect a different size and different compositions of households. A household with three persons is, after all,

more likely to have greater wealth than a one-person household.

What is particularly important for cross-country comparisons is that household size is not distributed randomly across countries. In the HFCS country dataset these differences among countries are very pronounced. While in Germany, Austria and Finland close to 40% of all households are one-person households (see ECB, 2013a), this share is below 20% in Spain, Malta and Portugal. Furthermore, within countries variation is also high. In Austria the share of one-person households is higher than 50% for Vienna and about 30% in Upper Austria and Carinthia.

Household structure will also be related to other factors. In Austria a lot of one-person households consist of young people, in other (mostly southern) countries it is mainly the old, because the young live longer with their parents. Also the availability of loans as well as cultural aspects or the population density might be linked to household structure. Thus, there is clearly a need to control for household composition when pursuing cross-country comparisons.

Also age patterns across countries matter. A household consisting of three adults will have different needs in terms of precautionary saving than a single mother with two kids below 14. These factors have to be taken into account when measuring net wealth levels. As we do not know the intra-household distribution of net wealth among household members it is not possible to plot a person-level wealth distribution without making assumptions about intra-household distribution. More research will be necessary to understand the role of household composition.

A simple assumption is that household wealth is shared equally by all house-

hold members (including children). Chart 3b shows the resulting personal net-wealth distributions presented analogously to chart 3a. Similar charts including all other HFCS countries can be found in the appendix. In general the country wealth distributions are somewhat closer at the personal level than at the household level. At the median, the figures range from just above the 35<sup>th</sup> euro area percentile for Germany to above the 85<sup>th</sup> euro area percentile for Luxembourg (at the personal level from around the 40<sup>th</sup> euro area percentile to below the 80<sup>th</sup>). That is not true for all parts of the distribution and the movement of a country's household distribution relative to its personal (household-size-adjusted household) distribution depends on the differences in household size and its distribution.

To provide an example: While Austria's household wealth distribution is below the euro area distribution (chart 3a) up to its 80<sup>th</sup> percentile, its personal distribution (chart 3b) is above the euro area personal distribution already from around the median onward. This demonstrates the effect of a higher number of single households on the results. The Greek distribution shifts further away from the euro area distribution in the upper part. While the 99<sup>th</sup> percentile is above the euro area 95<sup>th</sup> percentile in the household distribution it is below that benchmark in the personal distribution.

As the household is the unit of observation in the HFCS, households' differences matter in comparisons of household net wealth. As wealth is accumulated generally at the personal level, the most important variation is the number of persons a household consists of. Another important factor is age. These variables might explain part of the differences in net wealth between households and as a result



differences between countries if they differ structurally with respect to household composition.

## 2.5 Wealth versus Welfare

The HFCS covers the private wealth (referred to as net wealth or also net worth) of households, which must not be mixed up with “augmented wealth” (including also all entitlements to future pension streams), “total wealth” (including also human-, social- and cultural capital) or even welfare. Wealth is relatively straightforward to measure whereas welfare is much harder to pin down. Whereas the concept of welfare includes a notion of well-being the stock of wealth measured by the HFCS is a purely material concept. A certain amount of wealth need not even create the same volume of welfare for two persons with similar socioeconomic characteristics in a given country.

In its definition of wealth, the HFCS follows other well-established wealth surveys such as the SCF (Survey of Consumer Finances) or the EFF (Encuesta Financiera de las Familias) in Spain. Wealth can in general be – more or less easily – liquidated and transferred, and it can be used as collateral. Most individuals accumulate wealth for a rainy day, consumption, their children or old age provision (see Fessler et al., 2012a). Within the context of welfare programs, states partly provide substitutes for these forms of privately accumulated wealth. However, the degree to which states provide substitutes differs strongly from country to country. While in some countries individuals need to provide for old age themselves, in other countries saving for retirement is largely organized by the state via the public social security systems. While the pension systems might be one of the most important differences among countries, other dis-

similarities exist with regard to unemployment insurance, health insurance, maternity leave, family subsidies, other subsidies, and further state transfers which might affect saving patterns and therefore wealth accumulation.

To calculate the present value of an expected value of an insurance one has to take into account the value of the insurance and additionally the chance of an insurance incident taking place and insurance claims being honored. In the case of pension claims that implies knowledge of the year of retirement and information on life expectancy. In a household context the degree of complexity is especially high because of widow pensions and the conditional probabilities involved with those. Due to their different nature such claims are usually not part of scientific research on the distribution of private net wealth among individuals or households (see Davies and Shorrocks, 2000). Davies and Shorrocks use the term “augmented wealth” to refer to a broader definition of wealth also including all entitlements to future pension streams and at the same time point to a number of problems involved with such a broader definition (risk adjustments, discount rates, borrowing constraints, etc.). They are also not part of the ECB definition of private net wealth. Also the OECD (2013) points towards the importance of such future entitlements and possibilities to measure or estimate them, but at the same time also recommends the exclusion of pension entitlements in social security schemes for micro statistics mainly for the practical reasons mentioned above.

*“The exclusion of entitlements in social security schemes, as recommended here for micro statistics on household wealth, is primarily for practical reasons and to maintain consistency with the SNA’s definition of financial assets.”* (p. 71).

These differences might therefore explain part of the differences between wealth levels of otherwise similar households across countries. They are also relevant within countries as different households may be under different public insurance regimes, especially with regard to state pensions, depending on their age as well as occupation. In Austria the differences between self-employed persons, employees in the private sector as well as employees in the public sector may be especially pronounced.

There are also other forms of public services, like a safe environment, a cheap or even free well-functioning education system, an intact natural environment, and many more, which all will be relevant for welfare but are nevertheless not part of private household wealth. Private household wealth is only one, more or less important element of economic well-being. Wealth is special in so far as its functions for households change along its distribution. The wealth functions and their relation to well-being will differ in particular among rich and poor households. While in the lower wealth quintiles wealth serves precautionary purposes, it serves status and transfer functions in the middle and also power at the very top (see Fessler et al., 2012a).

There are publicly provided substitutes for private wealth, mostly in the form of future pension claims or claims on other types of insurances, which allow households in lower wealth deciles to consume more and bear less individual risk in society. The nature of these claims is different from private wealth as they can be neither liquidated nor transferred nor used as collateral. Nonetheless they might be an important factor explaining differences in wealth among households not only between but also within countries.

### 3 Conclusions

How accurate are the HFCS data? As the HFCS is very transparent with regard to the data production process it is an excellent tool for assessing a huge variety of economic questions. However, it is difficult to give an overall assessment of the “quality” of the HFCS wealth data. The most important quality issues concern statistical measurement.

Much deeper research is needed to better understand the multitude of factors influencing the dispersion of wealth in the euro area. Some national data sources may be potentially noncomparable. In particular the top 1% wealth shares are not suited for cross-country comparisons. Reaching an adequate portion of wealthy respondents in the HFCS will be a crucial challenge for each participating HFCS country in the second HFCS wave.

In this article we illustrate how the focus on means and medians can lead to misleading interpretation. Instead we argue for comparisons along the full unconditional net wealth distributions. Such analyses reveal large within-country variation as well as remarkable similarities between countries with regard to the distributions of net wealth.

Net Wealth distributions overlap considerably. In all countries there is a relatively large fraction of households with considerably higher net wealth than most of the households in all the other countries as well as a relatively large fraction of households with considerably lower net wealth than most of the households in all the other countries.

We discuss the relevance of household size and homeownership in this context and point out important caveats with regard to the interpretation of results. Household size matters and varies strongly between countries. In the appendix we summarize relevant

methodological differences which need to be taken into account in case of cross-country comparisons.

Country comparisons seem to be less problematic for economic models than for absolute values and the right tail of wealth distributions in particular. Caution is particularly needed when assessing the aggregate figures and households' estimates of business assets and income from financial wealth, which are much harder to assess for respondents than other components of wealth.

This paper addresses key issues of measurement of wealth related to the first wave of HFCS results. The most striking aspect of the wealth distribution in Europe is the high degree of wealth concentration in all euro area countries. Thus, if we want to address wealth inequality in the euro area, we need to concern ourselves mainly with inequality within countries and not inequality across countries. "The haves and the have-nots" (Milanovic, 2011) can be found in all countries of the euro area.

## References

- Albacete, N. 2012.** Multiple Imputation in the Austrian Household Survey on Housing Wealth. OeNB. Working Paper 176.
- Albacete, N., P. Lindner, K. Wagner and S. Zottel. 2013.** Eurosystem Household Finance and Consumption Survey 2010. Methodological Notes for Austria. Monetary Policy & the Economy Q3/12 – Addendum.
- Albacete, N. and M. Schürz. 2013.** Vergleich der Einkommensmessung für Haushalte in Österreich: HFCS versus EU-SILC. In: Statistiken – Daten & Analysen. Q2/2013. 88–98.
- Alvaredo, F., A. Atkinson, T. Piketty and E. Saez. 2013.** The Top 1 Percent in International and Historical Perspective. In: NBER WP Series No. 19075.
- Andreasch, M., P. Fessler and M. Schürz. 2013.** HFCS des Eurosystems – Möglichkeiten und Einschränkungen von Ländervergleichen im Euroraum. Mimeo.
- Atkinson, A., T. Piketty and E. Saez. 2011.** Top Incomes in the Long Run of History. In: Journal of Economic Literature 49(1). 3–71.
- Bover, O. 2008.** Wealth inequality and household structure US vs. Spain. Documentos de Trabajo 0804. Banco de España.
- Cowell, F., E. Kariagiannaki and A. McKnight. 2012.** Mapping and measuring the distribution of household wealth: A cross-country analysis. GINI Discussion Paper 71.
- Davies, J. and A. Shorrocks. 2000.** The Distribution of Wealth. In: Atkinson, A.B. and F. Bourguignon (eds.), Handbook of Income Distribution, Volume 1. Amsterdam: Elsevier. 605–675.
- Davies, J., S. Sandstrom, A. Shorrocks and E. Wolff. 2007.** Estimating the Level and Distribution of Global Household Wealth. UNU-WIDER Research Paper 2007/77.
- Davies, J. 2009.** Wealth and economic inequality. In: The Oxford Handbook of Economic Inequality. Oxford: Oxford University Press. 127–150.
- De Leeuw, E. 1992.** Data Quality in Mail, Telephone and Face to Face Surveys. Amsterdam: TT-Publikaties.
- De Leeuw, E. 2008.** The Effect of Computer-Assisted Interviewing on Data Quality: A Review of the Evidence, Department of Methodology and Statistics, Utrecht University 2008.
- Expert Group on Household Income Statistics – The Canberra Group. 2001.** Final Report and Recommendations. Ottawa.
- ECB. 2013a.** The Eurosystem Household Finance and Consumption Survey. Results from the First Wave. In: Statistics Paper Series 1 (April).

- ECB. 2013b.** The Eurosystem Household Finance and Consumption Survey. Methodological Report for the first wave. In: Statistics Paper Series 2 (April).
- Fessler, P. and M. Schürz. 2010.** Informationen zum kleinen Häuselbauer. In: *Wirtschaft und Gesellschaft* 36(2). 181–198.
- Fessler, P., P. Mooslechner and M. Schürz. 2012a.** Household Finance and Consumption Survey 2010. First Results for Austria. In: *Monetary Policy & the Economy* Q3/2012.
- Fessler, P., P. Mooslechner and M. Schürz. 2012b.** Fakten zur Vermögensverteilung in Österreich. In: *Sozialbericht 2011 – 2012*. BMASK.
- Fredriksen, B.K. 2012.** Less income inequality and more growth – are they compatible? Part 6. The distribution of wealth. OECD Economics Department WP 929.
- Kennickell, A. 2012.** Changes in U.S. Family Finances from 2007 to 2010: Evidence from the Survey of Consumer Finances. In: *Federal Reserve Bulletin* June 98(2).
- Lohmann, H. 2011.** Comparability of EU-SILC survey and register data: The relationship among employment, earnings and poverty. In: *Journal of European social policy* 21(1). 1–18.
- Milanovic, B. 2011.** The haves and the have-nots. A brief and idiosyncratic history of global inequality. Basic books.
- OECD. 2013.** OECD Guidelines for Micro Statistics on Household Wealth. OECD Publishing. <http://dx.doi.org/10.1787/9789264194878-en> (retrieved on July 11, 2013).
- Ohlsson, H., J. Roine and D. Waldenström. 2006.** Long-run Changes in the Concentration of Wealth. UNU-WIDER Research Paper 2006/103.
- Piketty, T. and E. Saez. 2012.** Top Incomes and the Great Recession: Recent Evolutions and Policy Implications. 13<sup>th</sup> Jacques Polak Annual Research Conference. IMF. Washington D.C.
- Sierminska, E., A. Brandolini and T. Smeeding. 2006.** The Luxembourg Wealth Study – A Cross-Country Comparable Database for Household Wealth Research. In: *Journal of Economic Inequality* 4(3). 375–383.
- Wolff, E.N. 2012.** The Asset Price Meltdown and the Wealth of the Middle Class. NBER Working Paper 18559. November

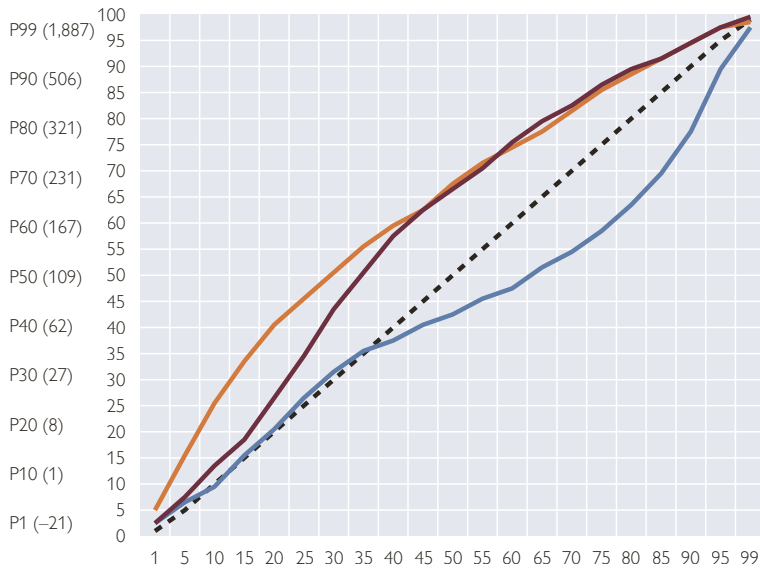
## Appendix

Chart 4

### Net Wealth Distribution in Europe Results for Belgium, Malta and Portugal

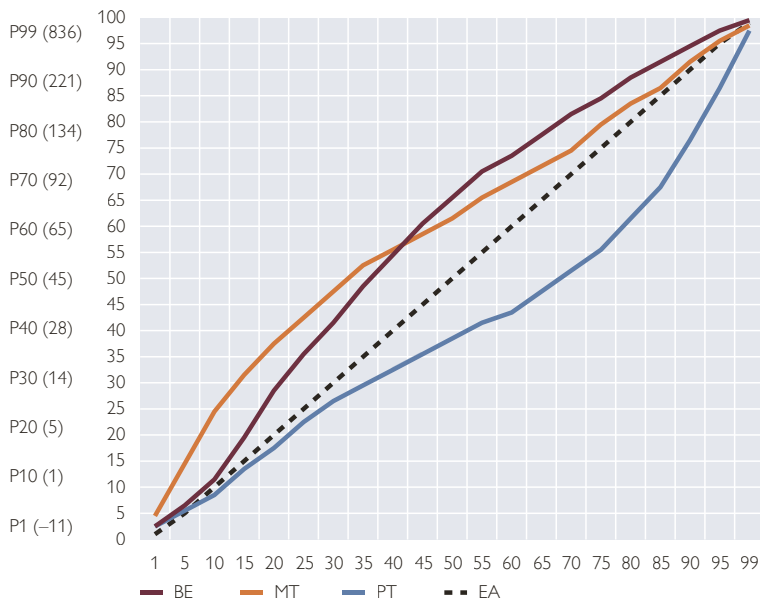
#### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



#### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

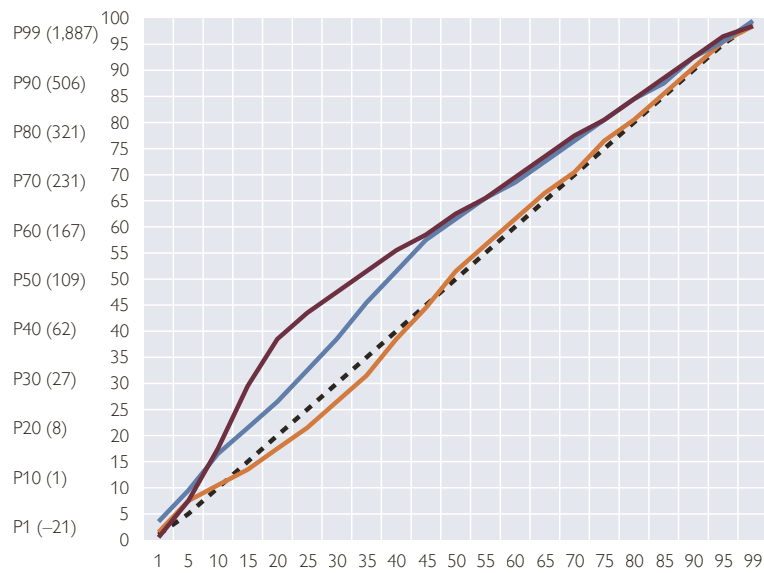
Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

Chart 5

## Net Wealth Distribution in Europe Results for Spain, France and Italy

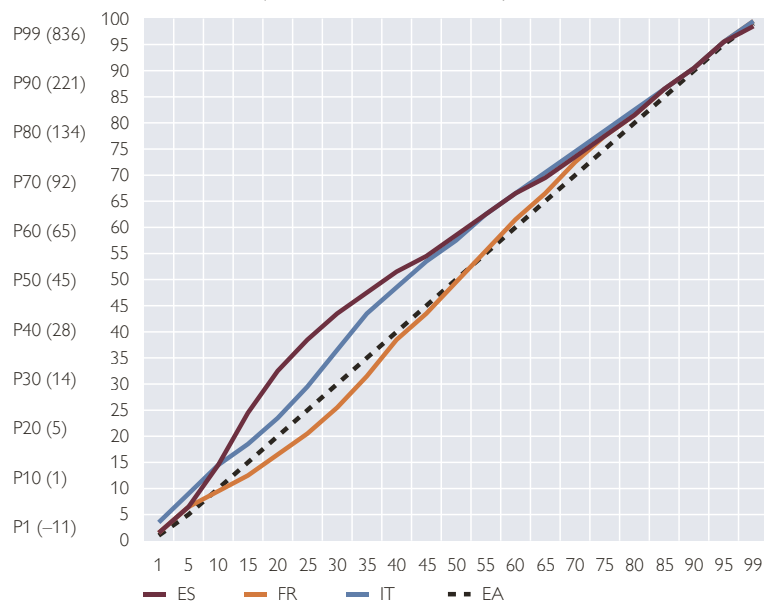
### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

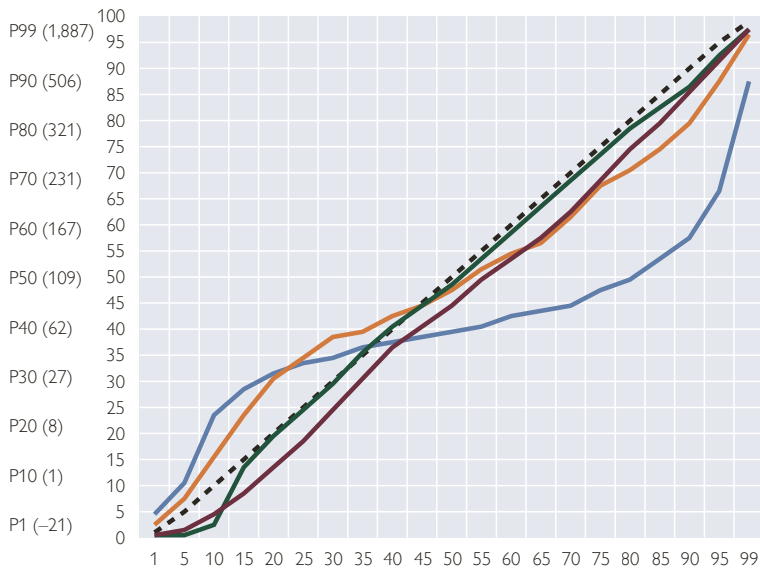


Chart 6

## Net Wealth Distribution in Europe Results for Finland, the Netherlands, Slovenia and Slovakia

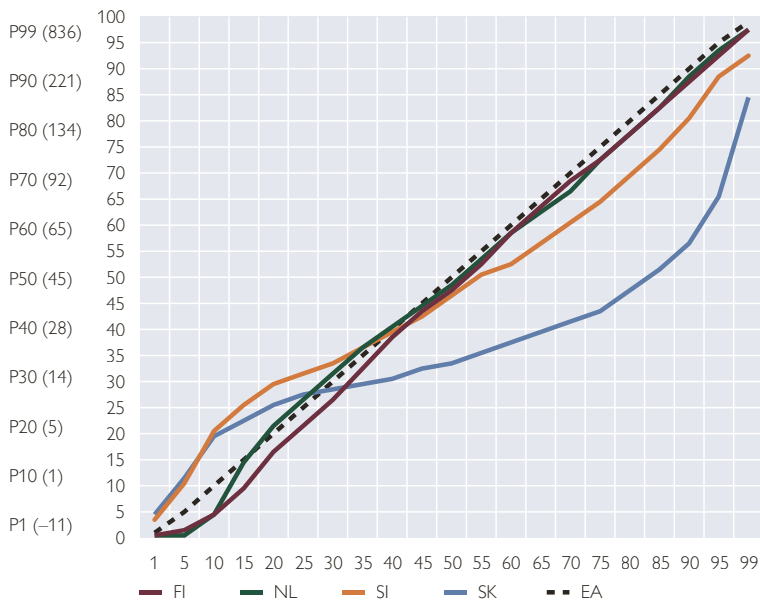
### a) Household Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



### b) Personal Net Wealth

Percentiles of euro area distribution (value in EUR thousand in brackets)



Source: OeNB.

Note: Percentiles of the country distributions range from 1 to 99. Personal distributions are produced under the assumption that household wealth is shared equally within households.

## A Comparison of HFCS Results with External Sources

### A.1 Comparison with National Accounts Data

There is still a widespread belief that national accounts data are closer to true wealth figures than household surveys. Very often researchers try to assess the quality of a survey by looking at the coverage of a certain item with regard to a similar aggregate figure in the national accounts. A higher coverage is considered to be indicative of a high-quality survey. Such comparisons are, however, flawed for most variables, and they are especially problematic for wealth figures for various reasons.

First of all the goal of national accounts statistics is to provide a comprehensive and concise picture of the economy of a nation, including the state and the private sector as well as the so-called household sector.

*“National Accounts are constructed in a way that tries to minimise bias in the estimates for the economy as a whole, as well as to minimise statistical discrepancies within the system. Thus, some bias may be recorded in the household sector accounts to satisfy the balancing constraints of the whole system of accounts. In some cases, certain economic transactions for the household sector may even be derived as residual, by subtracting from the estimated total the estimates of other institutional sectors.”* (ECB, 2013b, p. 90)

The national accounts are based on calculations and estimations of aggregate statistics and do not include any information about the distribution of wealth among single units such as firms, households or individuals, which would be a necessary prerequisite for any distributional analysis. Even if the household sector aggregates of the national accounts were closer to the true aggregates of the target populations of household surveys, knowing them would not

provide any insights into the distributions among households.

Second, the household sector is not the sum of households as they are usually targeted in household surveys. Households are by definition only a subset of the household sector in the national accounts. The European System of Accounts (ESA) defines the household sector as consisting of two subsectors: the so-called consumer and producer households (sector 14) as well as nonprofit institutions serving households (NPISHs) such as churches, political parties, trade unions, etc., as well as private foundations, which are quite important in Austria (sector 15). Even if wealth in the national accounts could be estimated for sector 14 only, the household concept of the national accounts would still be broader than that of household surveys, as the latter define only the net positions of producer households as households' business assets, whereas the national accounts include all assets and liabilities. And finally, even if it were possible to only include similar net positions of producer households in the national accounts estimate, the latter would still include the wealth of all persons living in so-called institutionalized households, such as prisons, monasteries or homes for the elderly, which are usually excluded from household surveys. Especially the wealth of people living in homes for the elderly might be relevant and even become more relevant over time as the share of the total population living in such institutionalized households rises (ECB, 2013b).

Even if some estimates of financial wealth might be very precise (for the household sector as a whole), many financial and nearly all forms of real wealth in the financial accounts are very rough estimates – being based on investment figures, balance sheet infor-

mation for firms, sometimes even only on nominal capital instead of an estimate of market value, or a residual resulting from the estimates for the other sectors. This might be especially relevant for the most important item of the household balance sheet, the main residence.

In the national accounts the aggregate figure on dwellings is estimated using investment figures. Per definition, additional structural alterations made by the households, relative price changes because of location or other events will not change these estimates, which reflect only construction costs. Land property is recorded in a different way as well. In the HFCS, owner households estimate the actual market value of their main residence including the land it is built on. Literature has shown that this is the best way to approximate the hypothetical market values. Of course, true market values only exist if an item is actually sold and, unlike many financial assets that are identical in value at a given point in time (shares of a given firm), every real estate property is different, if only because of its different location, and therefore not representative of any other real estate properties. The HFCS also includes additional information such as the purchase price of the main residence, the size, the location, the neighborhood, and many other details which also allow for the estimation of values using external sources.

There are also large differences with regard to the title under which certain items are recorded. In the HFCS household real estate property in other countries is recorded as a real asset. In financial accounts on the other hand real estate property in other countries qualifies as financial asset under the position “other equity.”

However, being aware of the differences in their primary goals, in defini-

tions, target populations and estimations, comparisons with the national accounts might still be of great value to help us to better understand problems of both statistical datasets. Household surveys are plagued with coverage problems especially at the tails of the distribution. The extent to which the important top of the distribution is not covered is unclear (see section B.6). When carefully comparing certain asset classes and using some assumptions on the amount of wealth held by institutionalized households as well as the other known differences and general underreporting in surveys, we might gain some insights on how much of total net wealth might be missing because of coverage issues at the top. Looked at it from the opposite angle, the empirical distributions revealed by surveys may help us to better understand details masked by national accounts aggregates and might even help improve estimates of real asset figures.

Thus, we are skeptical about macro-aggregates as a benchmark for household figures. Those statistics have different objects with different reference populations. Besides that, for many microeconomic applications, and especially for the behavior of households as economic agents, the perceived value of an object is more important than some value estimated by somebody else. Nevertheless all country-level HFCS datasets include enough information to also estimate house prices by using external house price indices or other information.

## A.2 Comparisons with Other Surveys

To compare the HFCS results with those of other surveys makes sense as similar results might provide positive signals for the quality of all surveys compared (see Albacete and Schürz,

2013). Beside the fact that differences in results might reflect sampling errors even if methods and timing were identical, in most cases, certain differences with regard to target population, exact framing of the questionnaire, survey mode, interviewer training, editing, imputation and all other factors in the process of data production might be a source for possible differences in results.

The EU Statistics on Income and Living Conditions (EU-SILC) might in many respects be the survey most similar to the HFCS, even though there are other surveys that might be more reasonable candidates for comparison for specific countries (e.g. the German Socio-Economic Panel, SOEP) or sub-populations and certain items of the HFCS (The Survey of Health, Ageing and Retirement in Europe for wealth of the elderly).

Whereas in most countries EU-SILC and the HFCS target the same household population, that is not the case for Austria and Italy. In Austria, the target population of EU-SILC includes only households living in a dwelling officially registered in the Austrian population register as a main residence, while the HFCS household definition also includes households possibly living in dwellings which are not registered as a main residence. This leads to a smaller average household size and a larger estimate of the total number of households for the Austrian HFCS (see ECB, 2013b, p. 99).

Furthermore, data collection methods differ substantially. Whereas the HFCS is a priori harmonized with regard to as many steps in the data production process as possible, the variety of different methods of data gathering (register vs. survey, different survey modes) is larger in EU-SILC. Finally, the HFCS provides harmonized stochastic

multiple imputations based on a Bayesian chained equation approach allowing variance estimation which takes into account the uncertainty from imputations as well as replicate weights which take into account the different complex survey designs. Combined, these allow for calculations of standard errors of estimates which are not artificially lowered by ignoring both phenomena.

As the HFCS is the first euro area-wide harmonized dataset on wealth, no other survey exists which would allow for comparisons with regard to this dimension.

Comparisons with other surveys might be helpful in order to gain some confidence in both surveys compared if the results are close. But this is only valid if the target populations are the same and if the methods used in data gathering and the statistical procedures used in the data production process are sufficiently similar.

## **B Methodological Comparability Issues**

This section highlights the most relevant comparability issues resulting from remaining differences in HFCS methodology. Though the HFCS ensures extensive harmonization compared to other cross-country survey projects, still more transparency concerning details of data production and more harmonization is needed. Differences in data production are one key to understanding cross-country differences. If overlooked, some differences attributable to them might be misleadingly attributed to other cross-country differences.

The euro area HFCS was guided by harmonized principles and methodologies with regard to all steps of data production. It is so far the only data source available for scientifically com-

paring net wealth at the household level among a large numbers of euro area countries. The degree of harmonization is large, which might imply that the HFCS even might offer an advantage in terms of income distribution comparisons over other datasets that survey income in greater detail but lack solid harmonization of the data production process across countries (EU-SILC).

However, one has to bear in mind that all decisions made with regard to the formulation of the questions asked, definition of the target population, sampling design, coverage, nonresponse, survey mode, editing, imputation, weighting design, tools for variance estimation and all other steps of survey production will have an influence on the bias and variance of estimates based on final data.

As regards the statistical processing, the HFCS established high-level frameworks and in some instances made fairly detailed prescriptions. But inevitably, there was room for interpretation and judgment, and the resulting variation may potentially affect the degree of true bias or uncertainty that is actually measured.

For example, the trimming of weights for outliers typically lowers the measured variance of final estimates, but at the expense of introducing a formal bias relative to the original sample design. There are similar trade-offs in other aspects of statistical processing, including adjustments for unit nonresponse, imputation, variance estimation procedures, and other areas. It should therefore be taken into consideration that datasets in which variance was traded against bias will more often deliver significant results, even though they may have a larger true bias, which cannot be measured (see also ECB, 2013b).

### **B.1 Timing**

Some differences within the HFCS are given a lot of attention, such as differences in the recording of data with respect to timing. Of course timing is an important issue with regard to comparability, and a goal of the HFCS is to increase coordination with regard to fieldwork. While most of the fieldwork took place in 2010/2011, there were exceptions for Spain (2008/2009), France (2009/2010) and Greece (2009). However, in the case of wealth surveys, timing is not as important as in surveys of income and consumption. Wealth as a stock is more stable than flows, and in comparison to other issues this will influence the results not that much. Patterns of wealth distributions are relatively stable over time – even in the United States, where more volatile forms of wealth like stocks are more widespread among households. Furthermore, many other data sources of asset price developments (e.g. house prices indices) are estimations themselves (e.g. in the case of Austria) and are often based on actual transaction prices that are hardly representative of the stock of real estate held by the full household population.

### **B.2 Sampling**

How the sample is drawn is a major element for the success of a survey. In all countries but Slovakia probability sampling was used. All units in the sample frame (representing the target population as well as possible) have a positive probability of being selected into the sample. Also the types of sample frames differ across countries. In some countries, telephone registers or other customer registers were used, in others, lists of dwellings derived from some sort of postal addresses or population registers. How well each frame mirrors the related target population is

unclear. For Austria detailed documentation can be found in the Methodological Notes (Albacete et al., 2013).<sup>2</sup> Differences also exist with regard to stratification as well as the number of stages and clusters. In Slovakia the income distribution mirrors that of EU-SILC – making the calculation of proper design weights impossible (ECB, 2013b, p. 30). As quota sampling is not based on probability there is no way to estimate correct sampling and standard errors. In the Netherlands an internet-based survey is used, which also might lead to severe problems with regard to representativeness of the sample and further comparability issues with regard to the survey mode.

### **B.3 Survey Mode, Field Phase Monitoring and Editing**

The standard method of data gathering used in the HFCS is a personal survey via Computer-Assisted Personal Interviewing (CAPI).

Finland deviates considerably from this method by gathering most wealth information from administrative data sources. While the latter might even have advantages with regard to measurement error, it allows for less detailed disaggregation and presumably leads to a lower degree of comparability with the other countries. The use of administrative data along with survey data might be problematic for cross-country comparisons (Lohmann, 2011). Additional information for Finland is largely based on Computer-Assisted Telephone Interviewing (CATI). Cyprus used CATI<sup>3</sup> (88% of observations) as well as CAPI (12% of observations). Finally, the

Netherlands used Computer-Assisted Web Interviewing (CAWI), a technique which might be especially problematic in terms of selective nonresponse and/or measurement error. Therefore, for comparisons with Finland, the Netherlands and Cyprus, the effects of different survey modes and data gathering techniques in general might be relevant and needs to be investigated carefully (De Leuww, 1992 and 2008).

Field phase monitoring and editing might be another relevant issue with regard to comparability. Whereas in some countries recontacting households was not possible at all (Germany, France, Luxembourg, Slovakia), households were extensively recontacted in others (Spain, Austria). Recontacting households makes it possible to prove/falsify extraordinarily high values or to clarify seemingly implausible answers of respondents and therefore reduces edits because of so-called “outliers.” See the Methodological Notes (Albacete et al., 2013) for an extensive documentation on editing in the Austrian HFCS.

### **B.4 Weighting**

Statistical data analyses based on samples suffer from different problems of misrepresentation. The most important source of misrepresentation in surveys is selective nonresponse. As long as the participation of households drawn into the sample is random, nonresponse would only lead to less precision (higher variance) but not bias the resulting estimates. In general, nonresponse in surveys on sensitive topics like income and wealth cannot be assumed to be random. In order to reduce this bias,

<sup>2</sup> Note that the household definition is different from the one used by Statistics Austria (Microcensus or EU-SILC), which only samples households at officially registered main residences in the Austrian “Melderegister.” This approach excludes all other households that may live in a dwelling not officially registered as a main residence. Statistics Austria reweights the sample to the total population under the assumption that excluded households are on average equal to the sampled ones.

<sup>3</sup> To a minor degree CATI was also used in Italy (15% of observations) and Malta (19% of observations).



nonresponse weights are calculated. To achieve meaningful nonresponse weights, information on both respondents and nonrespondents, i.e. all units in the gross sample, has to be available. The nonresponse weights in the Austrian HFCS also include interviewer-level information which was found to be relevant to predict nonresponse probabilities of sampled units. Detailed information on the weighting procedures in Austria can be found in the Methodological Notes (Albacete et al., 2013). It is unclear how strongly the weighting procedures differ across countries. And especially with regard to the important nonresponse weights it remains unclear how much information on nonrespondents and/or interviewer information was available to establish models of nonresponse probabilities. This topic needs to be further investigated in order to understand the possible role of nonresponse weighting with regard to the bias and variance trade-off in different countries. What is documented in the ECB Report (ECB, 2013b, p. 43) is the existence of weight trimming or limitations for weight adjustment factors in many countries (Greece, Finland, Germany, Luxembourg, Malta, Slovenia, Slovakia and Spain), which in general lead to additional bias and a decrease in variance. To better understand the degree of those effects more information on the exact procedures would be necessary for the second wave of the HFCS.

### **B.5 Imputation**

State-of-the-art multiple imputation based on a Bayesian chained equation approach is the HFCS standard procedure. A common approach toward item nonresponse which is based on stochastic as well as multiple imputation is necessary in order to reduce bias resulting from selective item nonresponse and, at the same time, to reflect the

uncertainty arising from the imputation process itself. All countries but Finland and Italy use this HFCS Standard Approach (ECB, 2013b, p. 47). However, the quality of imputation may differ. Some countries followed a broad conditioning approach more rigorously than others, including as many independent variables in the models as possible to preserve the relationships between as many variables as possible. Some countries used weighted regression or the weights as independent variables. Both reduce bias but at the same time increase variance. Automated model selection was used by some countries as opposed to a time-consuming user-based model specification. In Austria, for imputation as for all other steps of survey production, the primary goal was to reduce bias, even if at the cost of a certain increase in variance.

### **B.6 Coverage – Top of the Wealth Distribution**

Full coverage of the target population is essential for any survey. One important issue is to understand that most household surveys (including the HFCS) do not include the entire population. Institutionalized households such as people living in prisons, hospitals or homes for the elderly are excluded from the target population.

But even the target population is not fully covered. Especially the very top of the wealth distribution is hard to reach in household surveys. Selective nonresponse at the top of the distribution is a major issue because the wealth distribution is extremely skewed. We do not know what percentage of the wealthiest households is missing at the very top and we do not know to what degree different countries in the HFCS managed to include the very top.

There is reason to believe that oversampling of the wealthy might help

to increase precision and (because of the additional information about the wealthy) increase coverage at the top. It remains unclear how much these coverage issues compromise comparability especially for measures depending on the very top of the distribution or non-robust estimators (as e.g. top 1% shares or the mean).

Given the maximum household net wealth level reached by the Austrian survey (EUR 17 million), we can make an educated guess that around 0.5% at the very top of the distribution might be missing entirely. This guess is based on the trend list of the 100 richest persons in 2012 that starts with EUR 100 million. Under the assumption that the

net wealth of only a few thousands of households is in the range between EUR 17 million and EUR 100 million we may conclude that only a small group of wealthy households is missing. Given the fact that nonresponse weights might only to some extent remedy the nonresponse bias with regard to wealthier individuals it is very likely that also the relative amount of wealth held by the top 10% is downward biased. Oversampling of the wealthy was not possible in the case of Austria. The Austrian HFCS does not claim to represent the full range of the wealth distribution. Without the use of special sampling frames the sampling design will miss the very top of the distribution.